

NOTES ON *HOVEA* R. Br. (FABACEAE): 2

by

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ABSTRACT

Ross, J. H. Notes on *Hovea* R. Br. (Fabaceae): 2. *Muelleria* 7(1): 21–38 (1989). The six Western Australian species of the endemic Australian genus *Hovea* are revised. Descriptions, a key to the identification of the species, illustrations, and distribution maps are provided, together with notes on ecological preferences and relationships.

INTRODUCTION

The genus *Hovea* is represented in Western Australia by six species which are distributed largely within the South-West Botanical Province as defined by Beard (1980) with outliers in the Coolgardie Botanical District of the South-Western Interzone. The Western Australian species are isolated geographically from the remaining species in the genus and none is allied closely to any of the eastern or the northern species. Some specimens of *H. trisperma* with narrow leaves are superficially similar to specimens of *H. linearis* (Sm.) R. Br. from New South Wales but the two differ in many significant respects. In contrast to the eastern species, the Western Australian species are relatively straightforward taxonomically.

The Western Australian species do not form a homogeneous group and, apart from the obvious close relationship that exists between *H. stricta* and *H. pungens*, their affinities are not obvious. Some of the xeromorphic adaptations exhibited in the Western Australian species such as the rigid pungent-pointed leaves of *H. pungens* and *H. stricta*, the coriaceous leaves with sinuate prickly-toothed margins of *H. chorizemifolia*, and the short lateral spine-tipped shoots and minute leaves of *H. acanthoclada* are not found elsewhere in the genus.

The flowers of the Western Australian species are a deep intense blue or purplish-blue (except for the occasional white-flowered variants which occur throughout the range of the genus) in contrast to those of the eastern species which are usually a paler purplish-blue, pinkish-purple or insipid mauve. The inner surfaces of the pod valves of many of the eastern species are pubescent whereas those of the Western Australian species are all glabrous.

KEY TO THE WESTERN AUSTRALIAN SPECIES

1. Branches armed with short lateral spreading spine-tipped leaf-bearing shoots; leaves minute, up to 7 mm long 1. *H. acanthoclada*
1. Branches lacking spine-tipped shoots; leaves larger than above:
 2. Leaves rigid, the margins usually strongly revolute and apices mostly pungent-pointed:
 3. Leaves sessile or on petioles up to 0.5 mm long, typically inserted on the branch at an angle of more than 45° and almost at right angles to it, the lamina arching outwards or spreading laterally and often slightly reflexed; seeds mottled 5. *H. pungens*
 3. Leaves on short but distinct petioles 0.75–1.5 mm long, typically inserted on the branch at an acute angle (less than 45°) the lamina arching outwards and upwards with the apex pointing towards the apex of the branch; seeds uniform yellowish or olive-brown 6. *H. stricta*

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2. Leaves scarcely or distinctly coriaceous but not rigid, margins not strongly revolute, apices not pungent-pointed, or, if so, then margins usually sinuate and prickly-toothed:
4. Leaf margins usually distinctly sinuate and pungent-pointed, occasionally almost entire and almost lacking teeth but the upper stamen-filament free from the tube 2. *H. chorizemifolia*
4. Leaf margins entire, crisped or almost crenulate but not pungent-pointed, upper stamen-filament usually united to the tube:
5. Subshrub to 0.6 m high, stems often weak and sprawling unless supported; exterior of calyx clothed with appressed to slightly spreading hairs, the hairs mainly silvery-white or sometimes with an understorey of shorter rust-coloured hairs; lower surface of leaf with appressed, spreading or asymmetrically biramate hairs, the hairs often crimped; ovules 2-7 3. *H. trisperma*
5. Slender erect shrub or tree to 3 m high; exterior of calyx clothed with appressed hairs, the hairs all short and rust-coloured or sometimes with paler longer hairs interspersed; lower surface of leaf with predominantly or exclusively medifixed or asymmetrically biramate hairs; ovules 2 (very rarely 3 or 4) 4. *H. elliptica*
1. ***Hovea acanthoclada*** F. Muell., *Fragm.* 4: 15 (1863); Benth., *Fl. Austral.* 2: 174 (1864). LECTOTYPE (here selected): Western Australia, Phillips River, *Maxwell s.n.* (MEL).
- Daviesia? acanthoclada* Turcz., *Bull. Soc. Imp. Naturalistes Moscou* 26: 262 (1853). LECTOTYPE (here selected): Western Australia, *Drummond 5th coll. No. 90.* (KW; ISOLECTOTYPE: BM, G, K, NSW, PERTH, W).

Rigid divaricate *shrub* to 2 m high, single or many-stemmed, armed with short lateral spreading spine-tipped shoots which bear leaves and inflorescences; branches densely clothed with appressed to slightly spreading antrorse hairs, some of which are often asymmetrically biramate. *Leaves* solitary or appearing fascicled in twos or threes; lamina oblong, narrow-obovate, ovate or rotund, 1.5-7 mm long, 0.9-2 mm wide, rounded, obtuse or retuse apically, with or without a short mucro, margins revolute, glabrous above, sparingly to densely clothed with appressed often asymmetrically biramate hairs below; petiole up to 0.5 mm long. *Inflorescence* axillary, sessile or on peduncles up to 1.2 mm long. *Flowers* solitary or paired, pedicellate, the pedicels 1.5-4 mm long, clothed with appressed hairs; bracteoles ± 1 mm long, inserted at the base of or a short distance below the base of the calyx, much shorter than the calyx-tube, pubescent like the pedicel and bract; bract ± 1 mm long, inserted 1-2 mm below the bracteoles. *Calyx* turbinate-campanulate, densely clothed with short appressed hairs; 2 upper lobes 4.5-5.5 mm long including the tube 3-3.5 mm long, \pm truncate except for an acute tip; the lower 3 lobes 1.5-2.5 mm long. Standard 8-10.2 mm long, 8-10 mm wide, purplish-blue with a basal whitish horse-shoe shaped flare; wings 7-9 mm long, 2.9-3.7 mm wide, purplish blue; keel 5.7-6.5 mm long, 2.2-3 mm wide, purplish-blue apically, white basally. *Stamen-filaments* 4.5-6 mm long. *Ovary* 1.2-1.5 mm long, 2-ovulate, glabrous, on a stipe up to 1 mm long. *Pods* shortly stipitate, the stipe almost as long as the calyx, obliquely to transversely globular, ovoid or ellipsoid, 0.7-0.9 cm long, 0.9-1.1 cm wide, glabrous. *Seeds* elliptic, plump, 4-4.8 mm long, 2.3-3 mm wide, 2.2-2.7 mm thick, dark brown, aril extending for more than half the length of the seed (Fig. 1d-f).

Confined to southern Western Australia where there are two disjunct centres of distribution: one in the vicinity of Kalgoorlie and the other further south from the Fitzgerald River area to east of Ravensthorpe and southwards to Hopetoun (Fig. 2). Recorded from rocky outcrops, scree slopes, laterite and loam over granite in mallee, in tall *Eucalyptus* woodland and in association with *Acacia*, *Casuarina* and *Hakea* species.

REPRESENTATIVE SPECIMENS (total number examined 23):

Western Australia — Kalgoorlie, 16.viii.1963, *T. E. H. Aplin* 2259 (PERTH); Mt Short, N. of Ravensthorpe, 30.viii.1963, *A. S. George* 5711 (PERTH); E. side of Fitzgerald River valley, above Roes Rock, 18.xii.1970, *A. S. George* 10552 (PERTH); 13 km S. of Ravensthorpe towards Hopetoun, 27.vii.1983, *G. J. Keighery* 6223 (PERTH); 17 km due NE. of Ravensthorpe, near Woodenup Creek, 30.viii.1980, *B. R. Maslin* 4773 (PERTH).

TYPIFICATION:

Turczaninow based his description of *Daviesia? acanthoclada* on *Drummond 5th coll. No. 90* and, as a description of the pods and seeds is included in the protologue, it is clear that he saw a fruiting specimen. It would appear reasonable to assume that the Drummond specimen that Turczaninow saw is the one housed in KW but the specimen in KW lacks pods and seeds; there is no means of knowing whether or not pods and seeds were present in Turczaninow's time and have since been lost or whether he examined a specimen with pods and seeds elsewhere. Specimens of *Drummond 5th coll. No. 90* in G (2 sheets), K (2 sheets), NSW, PERTH (ex K) and W bear pods and seeds. Despite the lack of pods and seeds, I here select the Drummond collection in KW as the **LECTOTYPE** of *D.? acanthoclada*, the collections in G, K, NSW, PERTH and W being treated as **ISOLECTOTYPES**.

NOTES:

Mueller, *Fragm.* 4: 15 (1863), based his description of *H. acanthoclada* as far as one can tell on a Maxwell collection from Phillips River. There is no reference by Mueller, either direct or implied, to the earlier name *Daviesia? acanthoclada* Turcz. based on *Drummond 5th collection No. 90*.

It has been customary to regard *H. acanthoclada* as a new combination by Mueller based on *Daviesia? acanthoclada* but *H. acanthoclada* Mueller is treated here as a new name as I believe that when Mueller described *H. acanthoclada* he thought that he was providing a name to a taxon that previously was without a name. Perusal of the pages of *Fragm.* 4 following the description of *H. acanthoclada* shows that Mueller was meticulous about citing references to earlier published descriptions if he was aware that they existed. The absence of any reference whatsoever by Mueller to *D.? acanthoclada* therefore seems to be of significance.

Circumstantial evidence supports the view that Mueller was unaware of Turczaninow's earlier name. In the Appendix to the 1864–65 Annual Report as Director of the Botanic Gardens, *Bull. Soc. Imp. Naturalistes Moscou* is not listed by Mueller among the holdings of the library. It is probably unlikely that he would have omitted the journal from his list inadvertently. Records in the State Library of Victoria indicate that the journal was not acquired by the State Library prior to 1869 and there was no other library in Victoria likely to have contained the publication. There is no specimen of *Drummond's 5th collection No. 90* in MEL, so Mueller could not have seen a named collection. All of the incoming correspondence to Mueller was destroyed in the 1930s so there is no means of knowing whether he was aware of the name from that source.

Mueller's choice of the same specific epithet as Turczaninow does not seem to be too great a coincidence for credibility. The occurrence of spine-tipped branches occurs nowhere else in the genus so the presence of this character would suggest itself as a fairly obvious specific epithet. Furthermore, Mueller had used the same epithet for *Acacia acanthoclada* in *Fragm.* 3: 127 (1863) published shortly before *H. acanthoclada*.

H. acanthoclada differs from all of the other species in having spine-tipped branches and minute leaves. It is reminiscent of some of the xeromorphic *Bossiaea* species.

2. ***Hovea chorizemifolia*** DC., *Prodr.* 2: 116 (1825) (as *chorizemaefolia*); Sweet, *Hortus Britannicus* 2: *addenda* 475 (1827); Lindley in *Edwards's Bot. Reg.* 18: t. 1524 (1832) (as *chorozemaefolia*); Benth., *Fl. Austral.* 2: 174 (1864).

Plagiolobium chorizemifolia (DC.) Sweet, *Fl. Australasica* t. 2 (1827); Meissn. in

Lehm., Pl. Preiss. 1: 80 (1844); Wheeler, Fl. Perth Region 268 (1987). LECTOTYPE (here selected): Western Australia, collector unknown, (G-DC).

H. ilicifolia Sweet, Hortus Britannicus 1: 111 (1826) *nomen nudum*.

Plagiolobium ilicifolium Sweet, Fl. Australasica t. 2 (1827) partly but excluding the pod; Meissn. in Lehm., Pl. Preiss. 1: 80 (1844). NEOTYPE: Western Australia, Drummond 182 (MEL; ISONEOTYPE: BM, K, NSW, W).

H. ilicifolia Cunn. in Lindley, Edwards's Bot. Reg. 30: t. 58 (1844). LECTOTYPE (here selected): Western Australia, King Georges Sound, A. Cunningham (CGE).

Plagiolobium chorozemaefolium var. *subintegrum* Meissn. in Lehm., Pl. Preiss. 1: 80 (1844). SYNTYPES: Western Australia, between Greenmountain and Mahogany Creek, 12.ix.1839, Preiss 1052 (HBG, K, LD, MEL, NY, W); Western Australia, Drummond 181 (BM, K, MEL, NSW, W).

Plagiolobium chorozemaefolium var. *dentatum* Meissn. in Lehm., Pl. Preiss. 1: 80 (1844). LECTOTYPE (here selected): Western Australia, Mount Melville, 25.ix.1840, Preiss 1058 (LD; ISOLECTOTYPE S).

Shrub or subshrub to 0.6 m high with one or several stems arising from the base, stems branched or sometimes simple, sparingly to densely clothed with appressed antrorse or spreading often rusty hairs, glabrescent. *Leaves*: lamina ovate, elliptic to lanceolate, those on lower leaves often shaped differently to those on upper leaves, margins usually distinctly sinuate and prickly-toothed but occasionally almost entire and almost lacking teeth, 1.5–8 cm long including a pungent point up to 0.6 cm long, 0.8–4 cm wide (including the teeth), coriaceous, glabrous throughout or with scattered hairs on lower surface of midrib and/or lamina, venation sometimes prominently reticulate; petiole 0.5–3.5 mm long. *Stipules* subulate, up to 4.5 mm long, 0.45 mm wide. *Inflorescence* axillary, sessile or on peduncles up to 1.5 mm long, 2–6 flowered. *Flowers* pedicellate, the pedicels 2–5 mm long, densely pubescent with long straightish hairs scattered in amongst shorter curled hairs; bracteoles subulate, up to 3.5 × 0.6 mm, inserted ± 1 mm below the calyx, pubescent when young but glabrescent; bract subulate, up to 3 × 0.6 mm, inserted 1–3.5 mm below the bracteoles. *Calyx* densely clothed with long straightish hairs and shorter curled or crinkled hairs; 2 upper lobes 5–6 mm long including the tube 2–2.5 mm long, up to 7 mm across, emarginate; the 3 lower lobes 1.2–2.5 mm long. *Standard* 10.4–14 mm long, 10–13 mm wide, purplish-blue with a basal whitish horse-shoe shaped flare; wings 8–9.5 mm long, 4–4.5 mm wide, purplish-blue; keel 4–7 mm long, 2.5–3 mm wide. *Stamen-filaments* 4–4.5 mm long, staminal sheath open on the upper side and sometimes also on the lower, upper filament usually free. *Ovary* sessile, 1–1.5 mm long, 2-ovulate, glabrous. *Pods* shortly stipitate, globular, ovoid or ellipsoid, 0.8–1.1 cm long, 0.8–1 cm wide, glabrous. *Seeds* elliptic, 4.5–5.5 mm long, 3.2–3.7 mm wide, olive-brown or brown, aril extending for more than half the length of the seed. (Fig. 1 g–i).

Confined to the Darling, Avon and Eyre Botanical Districts of the Southwestern Botanical Province of Western Australia as defined by Beard (1980) occurring from the vicinity of Bindoon north-east of Perth south-eastwards to York, Narrogin and the Bremer River north-east of Albany (Fig. 2). The label accompanying one specimen (MEL 667133) alleges that the specimen was collected by Maxwell in 1875 'near Cape Arid'. This is considerably further east than any other records of the species and suggests that the label may not belong with the specimen.

Recorded from laterite, gravel, granite outcrops, sand and in karri forests in sandy soils rich in organic matter. In the northern part of its range and in the Darling Range *H. chorizemifolia* often grows in association with *H. trisperma* whereas in the karri forests it is often associated with *H. elliptica*.

REPRESENTATIVE SPECIMENS (total number examined 246):

Western Australia — 5 km S. of Margaret River township on Caves Road, 28.x.1983, M.G. Corrick 8966 (MEL); Bindoon, 3.ix.1964, J. Galbraith 561A (MEL). Dwellingup, 25.ix.1942, C.A. Gardner 6484 (PERTH); Greenmount, Darling Range, 23.vii.1898, A. Morrison (AD, MEL, PERTH); Knoll Drive, Nornalup-Walpole National Park, 9.ix.1971, S. Paust 346 (PERTH); York, 4.vi.1905, O.H. Sargent (NSW).

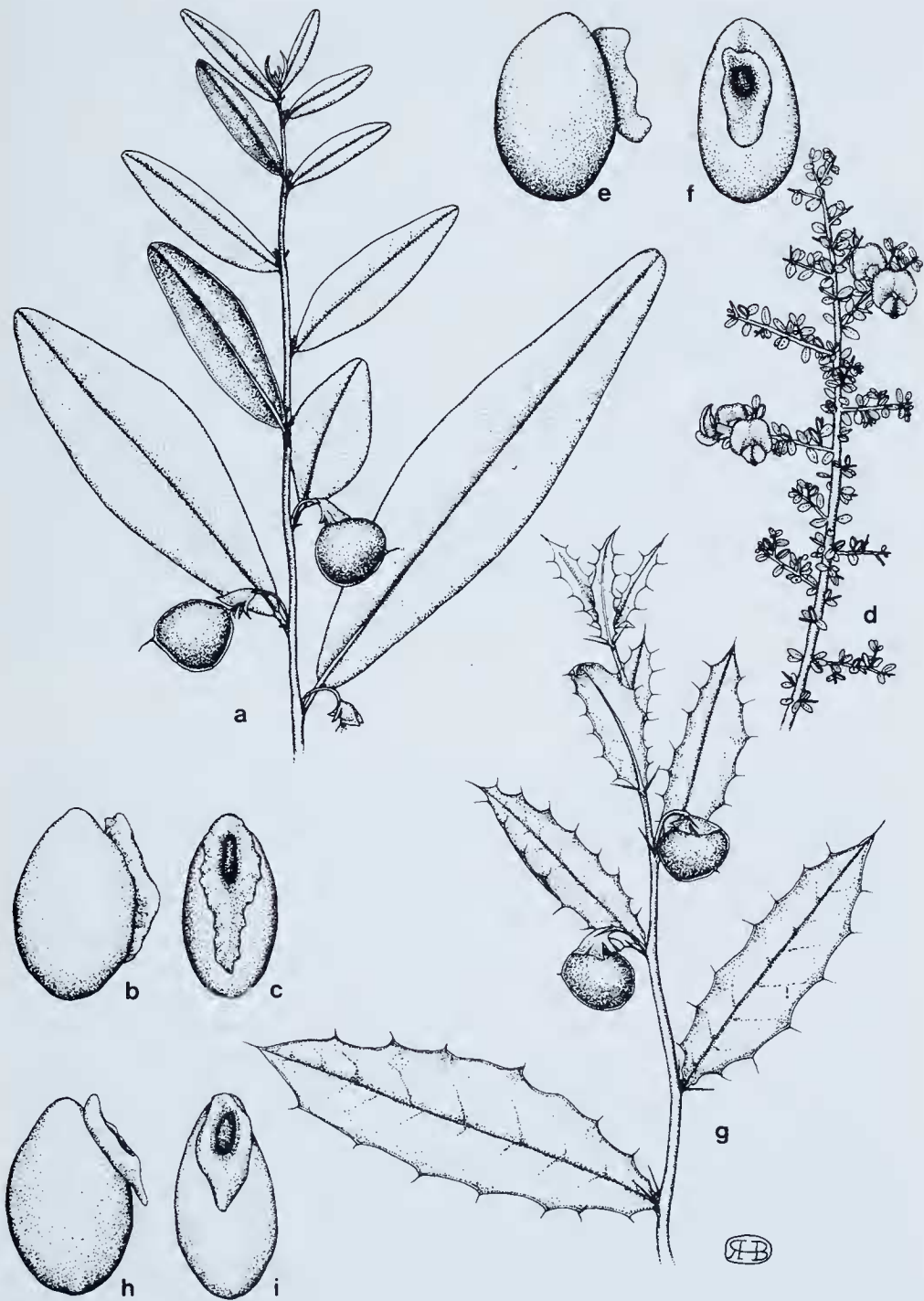


Fig. 1. *Hovea elliptica*. a — fruiting twig, $\times 1$. b — seed, side view, $\times 6$. c — seed, hilar view, $\times 6$. *H. acanthoclada*. d — flowering twig, $\times 1$. e — seed, side view, $\times 6$. f — seed, hilar view, $\times 6$. *H. chorizemifolia*. g — fruiting twig, $\times 1$. h — seed, side view, $\times 6$. i — seed, hilar view, $\times 6$. a-c from R.A. Kilgour 520 (MEL); d from G.J. Keighery 6223 (PERTH); e-f from A.S. George 10552 (PERTH); g from M.G. Corrick 9597 (MEL); h and i from F. Mueller s.n. (MEL 667151).

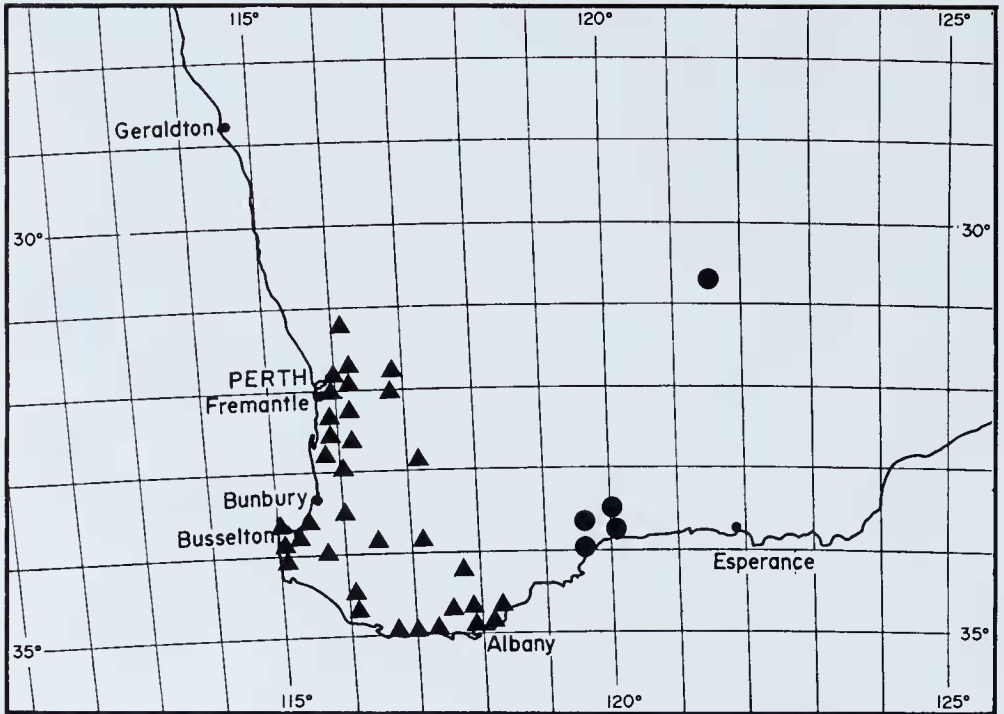


Fig. 2. The known distribution of *Hovea acanthoclada* (●) and *H. chorizemifolia* (▲).

TYPIFICATION:

There are in De Candolle's herbarium in Geneva four specimens of *H. chorizemifolia*. The specimen bearing a label which reads 'aff. *chorizema*. Nouvell(e) Holland côte orient Mus de Paris 1491' pinned to the sheet is selected from among these specimens as the LECTOTYPE of *H. chorizemifolia*. De Candolle recorded that the species came from eastern Australia but this is an error.

Plagiolobium ilicifolium, described by Sweet in a footnote, was based on a specimen in A. B. Lambert's herbarium collected by Captain King at King Georges Sound. Unfortunately I have not succeeded in locating this specimen but it is clear that if the pod was described correctly as pubescent internally and externally it did not belong with the specimen. The alternative possibility that neither the specimen nor the pod is referable to *H. chorizemifolia* is considered less likely as the leaf illustrated in t. 2 falls within the range of variation of this species. As it is considered that the leaf alone illustrated in t. 2 is inadequate for the purpose of serving as a lectotype, Drummond 182 (MEL) is selected here as the NEOTYPE of *P. ilicifolium*. ISONEOTYPES are housed in BM, K, NSW and W.

It is clear from the protologue that *H. ilicifolia* Cunn. was recognized as a species distinct from *Plagiolobium ilicifolium* Sweet because it had glabrous pods in contrast to the pods of the latter species which had been described as pubescent. *H. ilicifolia* was based on a plant or plants raised by R. Mangles from seed from Swan River and on material collected by A. Cunningham at King Georges Sound. There is in Lindley's herbarium at CGE a sheet consisting of three twigs, two of which bear persistent calyces, an envelope containing the remnants of a pod and a mature and an immature seed, and a label just above the bottom right hand corner which reads '*Hovea ilicifolia* C. King Georges Sound. 1822'. Although the collector is not indicated, I am satisfied that this is one of the Cunningham specimens alluded to by Lindley. In Herbarium Benthamianum at K there is a sheet containing four different collections including some of Cunningham's. The flowering specimen second from the right, which is mounted with the apex at the foot of the sheet, has a label attached to its base with

'*Hovea ilicifolia* see *Plagiolobium*' written on it. The label at the foot of the sheet which covers the apex of the shoot indicates that the specimen was collected by Cunningham at King Georges Sound. These two collections are regarded as SYNTYPES of *H. ilicifolia*. I here select the fruiting specimen in CGE as the LECTOTYPE of *H. ilicifolia* Cunn..

NOTES:

The upper stamen-filament in *H. chorizemifolia* is usually free from the others, a feature which occurs only sporadically and irregularly in other species.

The leaves typically have distinctly sinuate pungent-pointed margins and a pungent apex and are very characteristic. However, leaf size and leaf shape, especially the shape of the margins, vary quite markedly and occasional specimens occur in which the margins are only slightly sinuate or undulate and possess only a few marginal teeth, for example, *J.H. Willis s.n.* (MEL 1532104). Some of these specimens (corresponding to var. *subintegrum* recognized by Meissner), which occur within the distributional range of both *H. chorizemifolia* and *H. elliptica*, have been confused in the past with *H. elliptica* or considered as intermediates between the two species but they are referable to *H. chorizemifolia*. These specimens have the bract and bracteoles of *H. chorizemifolia* rather than those of *H. elliptica*, the upper stamen-filament is always free as in *H. chorizemifolia* and the lower surfaces of the leaves lack the distinctive asymmetrically biramate or medifixed hairs which are characteristic of *H. elliptica*. Even although the two species often grow together their habits are quite different. Leaf shape in *H. chorizemifolia* is clearly more variable than previously realized, but, despite this, there does not appear to be a means of dividing up the range of variation satisfactorily.

White-flowered variants occur occasionally, for example, *Mrs W.A. Ross* (PERTH) from Waroona.

3. ***Hovea elliptica*** (Sm.) DC., Prodr. 2: 115 (1825); Sweet, Hortus Britannicus 1: 111 (1826); Benth., Fl. Austral. 2: 175 (1864).

Poiretia elliptica Sm., Trans. Linn. Soc. Lond. 9: 305 (1808); *Phusicarpos elliptica* (Sm.) Poiret in Lamarck & Poiret, Encycl. meth. Bot. suppl. 4: 400 (1816). LECTOTYPE (here selected): Western Australia, King Georges Sound, 1803, Menzies (LINN, sheet 1190.2).

Platychilum celsianum Delaunay, Herb. Amat. t. 187 (1815); *Goodia simplicifolia* Spreng., Syst. Veg. ed. 16, 4(2): 267 (1827). LECTOTYPE (here selected): Delaunay, Herb. Amat. t. 187.

H. celsii Bonpl., Descr. Pl. Malmaison t. 51 (1816). LECTOTYPE (here selected): Descr. Pl. Malmaison t. 51.

Slender *shrub* or tree to 3 m high, often single-stemmed, young branches densely clothed with appressed to slightly spreading hairs, the hairs predominantly or exclusively medifixed or asymmetrically biramate, often rust-coloured. *Leaves*: lamina almost flat, elliptic, ovate-elliptic, obovate-elliptic to obovate or fusiform, (1.5-)2.5-10(-14) cm long, (0.5-)1-3.2(-6) cm wide, obtuse, emarginate, retuse or mucronate apically, glabrous above and reticulate, the venation usually prominent, lower surface and midrib sparingly to densely clothed with predominantly or exclusively medifixed or asymmetrically biramate hairs; petiole 0.8-1 cm long, sparingly to densely clothed with medifixed or asymmetrically biramate hairs. *Stipules* narrow-triangular, up to 1 mm long and 0.5 mm wide, sparingly to densely clothed with medifixed or asymmetrically biramate hairs. *Inflorescence* axillary, sessile or a pedunculate raceme, sometimes auxotelic, 1-7 flowered. *Flowers* pedicellate, the pedicels 4-9 mm long, densely clothed with rusty appressed hairs; bracteoles 1-1.5 mm long, up to 0.5 mm wide, inserted at the base of the calyx and appressed to it or inserted up to 1 mm below the calyx and free from it, densely clothed with appressed rusty hairs; bract 1-1.5 mm long, up to 0.5 mm wide, inserted at base of pedicel and 5-8 mm below the bracteoles, densely clothed with rusty appressed hairs. *Calyx*

densely clothed with appressed hairs, the hairs either all short and rusty or sometimes with longer paler hairs interspersed: 2 upper lobes 5.1–6.4 mm long including the tube 1.8–2.9 mm long, 6–8.1 mm across, emarginate; the 3 lower lobes 1.3–2.5 mm long. *Standard* 10.5–14.5 mm long, 11.5–17 mm wide, purplish-blue with a basal whitish horse-shoe shaped flare; wings 7.8–9.6 mm long, 3.5–5.5 mm wide, auricled, purplish-blue; keel petals 7.2–8.1 mm long, 2.6–3.2 mm wide, the inner margin sometimes papillate, purplish-blue. *Stamen-filaments* 5.5–6.2 mm long. *Ovary* 1.2–1.6 mm long, on a stipe 1–1.5 mm long, ovules 2 (rarely 3 or 4), glabrous; stigma papillate. *Pods* stipitate, the stipe about as long as the calyx, obliquely to transversely globular, ovoid or ellipsoid, 0.8–1.2 cm long, 0.8–1.3 cm wide, 0.7–1 cm thick, glabrous. *Seeds* elliptic, plump, 3.8–5.1 mm long, 2.8–3.1 mm wide, 2–2.7 mm thick, olive-brown or brown, the aril extending for more than half the length of the seed. (Fig. 1a–c).

Confined to the Menzies and Warren subdistricts of the Darling Botanical District and the western Eyre Botanical District of the Southwestern Botanical Province of Western Australia as defined by Beard (1980) occurring from the Preston River in the north to Cape Naturaliste and Cape Leeuwin in the west and south-eastwards to the Bremer River (Fig. 3). The label accompanying one specimen (MEL 666464) alleges that the specimen was collected by Maxwell in 1875 'near Cape Aird'. This is considerably further east than any other records of the species and suggests that the label may not belong with the specimen.

Recorded from laterite, gravel, granite outcrops, clay loam, stabilized sand dunes, sandy loam and sandy soils rich in organic matter. A common understorey plant, often with *Bossiaea laidlawiana* and *H. chorizemifolia*, in karri-jarrah-marri forests and woodland.

REPRESENTATIVE SPECIMENS (total number examined 222):

Western Australia — 5 km S. of Margaret River township on Caves Road, 28.x.1983, M.G. Corrick 8959 (CBG, HO, MEL, NSW, PERTH). Davidson's Road, near corner of Coronation Road, W. of Manjimup, 10.x.1984, M.G. Corrick 9238 (MEL). Willyung Hill, about 12 km N. of Albany, 23.ix.1984, D.B.

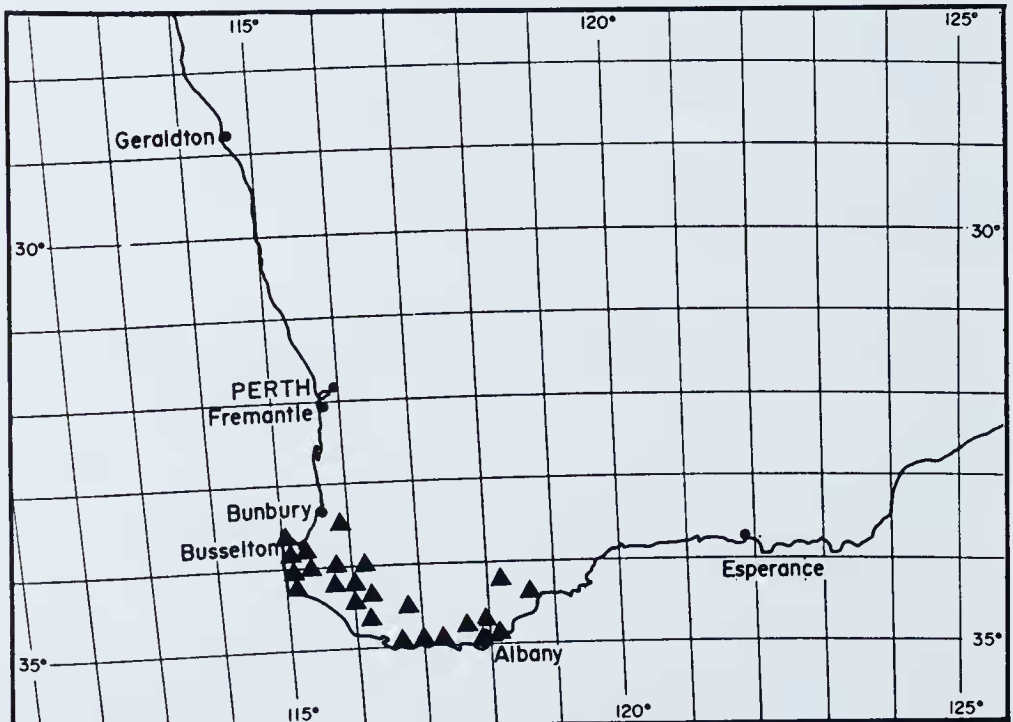


Fig. 3. The known distribution of *Hovea elliptica*.

Foreman 829 (AD, CBG, MEL, PERTH). Northern slope of Castle Rock, Porongurup Range, 29.ix.1966, T.B. Muir 3966 (MEL). Bremer River, 1884, W. Webb (MEL 66439).

NOTES:

In stature *H. elliptica* is by far the largest of the Western Australian species. Some specimens of *H. trisperma* with large elliptic leaves are sometimes superficially similar to and have been confused with *H. elliptica*. Apart from differences in habit, *H. elliptica* invariably has 2 ovules per ovary in contrast to the specimens of *H. trisperma* which have 3–6 ovules per ovary, the indumentum on the lower surface of the leaves is different and the shape of the lamina itself is different.

Occasional white-flowered specimens of *H. elliptica* occur.

4. *Hovea trisperma* Benth. in Endl. *et al.*, Enum. Pl. Huegel 37 (1837); Meissn. in Lehm., Pl. Preiss. 1: 79 (1844); Benth., Fl. Austral. 2: 175 (1864); Wheeler, Fl. Perth Region 269 (1987). LECTOTYPE (here selected): Western Australia, King Georges Sound, Huegel s.n. (W).

H. lanceolata var. *linearis* Lindley in Edwards's Bot. Reg. 17: t. 1427 (1831). LECTOTYPE (here selected): Fragment from cultivated plant in Low's nursery, 1831, (CGE).

H. manglesii Lindley in Edwards's Bot. Reg. 24: t. 62 (1838). LECTOTYPE (here selected): Specimen from plant cultivated by R. Mangles, 1837, (CGE).

H. crispa Lindley in Edwards's Bot. Reg. 25: misc. 19 (1839). *H. trisperma* var. *crispa* (Lindley) Benth., Fl. Austral. 2: 176 (1864). LECTOTYPE (here selected): Specimen from plant cultivated by R. Mangles (CGE).

H. grandiflora Drummond, Hooker's J. Bot. 2: 365 (1840). *H. trisperma* var. *grandiflora* (Drummond) Benth., Fl. Austral. 2: 176 (1864). LECTOTYPE (here selected): Western Australia, Drummond (K).

H. splendens Paxton, Paxton's Mag. Bot. 10: 70, plate facing p. 103 (1843). LECTOTYPE (here selected): Paxton's Mag. Bot. 10: plate facing p. 103.

H. elliptica sensu Meissn. in Lehm., Pl. Preiss. 1: 79 (1844) *non* (Sm.) DC.

Subshrub to 0.6 m high with one or several stems arising from the base, stems often weak and sprawling unless supported by surrounding vegetation, young branches sparingly to densely clothed with appressed medifixed or asymmetrically biramate antrorse or spreading hairs, the hairs sometimes crimped or twisted. *Leaves*: lamina ovate, obovate, elliptic, elliptic-oblong, lanceolate, linear-oblong or on basal leaves occasionally almost rotund, those on lower leaves often shaped differently to those on upper leaves, (0.8–)2–8(–13) cm long, (0.3–)0.7–3.6 cm wide, obtuse, acute or shortly mucronate apically, margins slightly to distinctly recurved, entire, crisped or almost crenulate, upper surface pubescent especially when young or glabrous, sometimes prominently reticulate, lower surface sparingly to densely clothed with appressed to spreading or asymmetrically biramate often crimped hairs; petiole 1–3 mm long. *Stipules* subulate, up to 2 mm long, pubescent, sometimes persisting. *Inflorescence* axillary, sessile or on short peduncles, 1–6-flowered. *Flowers* pedicellate, the pedicels 1–7 mm long, densely clothed with appressed to spreading hairs; bracteoles subulate, 1.5–3 mm long, inserted at the base of or up to 2 mm below the calyx, pubescent; bract subulate, up to 3 mm long, inserted at the base of the pedicel. *Calyx* densely clothed with appressed antrorse to slightly spreading hairs: 2 upper lobes 6.1–11.7 mm long including the tube 2–4.5 mm long, emarginate; the 3 lower lobes 1.4–2 mm long. *Standard* 10.8–20.2 mm long, 10.5–25 mm wide, purplish-blue with a basal white horseshoe shaped flare; wings 9–14.8 mm long, 3.1–8 mm wide, purplish-blue; keel 6–11.6 mm long, 2.3–4 mm wide. *Stamen-filaments* 5–8 mm long, staminal sheath open on upper side and sometimes also on lower, occasionally the upper filament free. *Ovary* subsessile or on a stipe up to 2 mm long, 2–7-ovulate, glabrous. *Pods* shortly stipitate, the stipe about half as long to as long as the calyx-tube, globular, ovoid or ellipsoid, sometimes transversely so, 0.8–1.2 cm long, 0.8–1.2 cm wide, 0.65–1 cm thick, glabrous. *Seeds* elliptic, 4–6 mm long, 2.6–3.8 mm wide, 2–2.7 mm thick, uniform olive- to dark brown, aril collar-like with a raised upper lip, about $\frac{1}{2}$ to $\frac{2}{3}$ as long as the seed, margin sometimes slightly frilled.

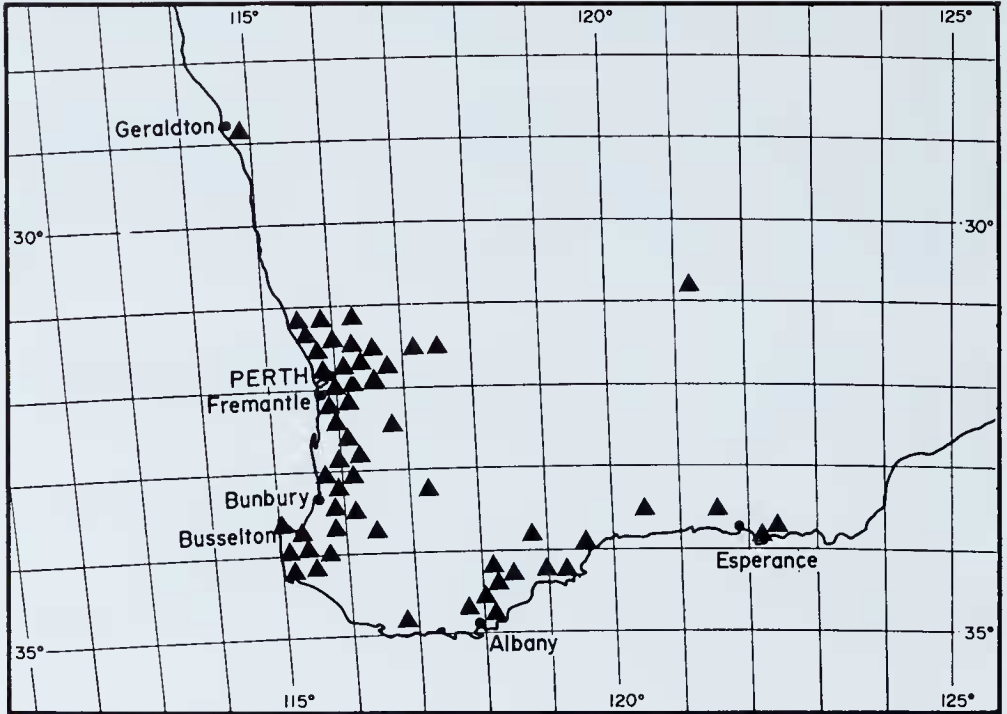


Fig. 4. The known distribution of *Hovea trisperma*.

Confined to the Irwin, Avon, Darling and Eyre Botanical Districts of the South-western Botanical Province of Western Australia as defined by Beard (1980) occurring from Mogumber in the north southwards to Augusta and eastwards with several large disjunctions to Duke of Orleans Bay east of Esperance. There are three early records from two localities far removed from the general range of distribution and confirmation of the existence of the species at these disjunct localities is required. The labels accompanying two specimens (NSW 58717, NSW 58737) indicate that they were collected by L. C. Webster in 1899 and 1900 respectively at Coolgardie, and the label accompanying a third specimen indicates that it was collected by F. Stoward (PERTH) at Geraldton in Sept. 1917. These localities are respectively much further west and north than those of any other records (Fig. 4).

Recorded from sandy soil in heath, tall *Banksia*, *Xanthorrhoea* or *Casuarina* – marri woodland, and in laterite, gravel and clay loam in *Eucalyptus* woodland or mallee. Occasionally found in wet low-lying areas in association with *Melaleuca*. Often growing in association with *H. chorizemifolia* in areas where the distribution of the two species overlaps.

REPRESENTATIVE SPECIMENS (total number examined 325):

Western Australia — Logue Brook Dam, hillside above Clarke Brook, 9.x.1984, M.G. Corrick 9212 (MEL 669610); near Brookton Highway, ca. 11 km E. of Kelmescott, 10.x.1985, M.G. Corrick 9635 (MEL 677476); near Gingin, 17.vii.1920, C.A. Gardner 574 (MEL 1529399, PERTH); Wharton Beach, Duke of Orleans Bay, 30.ix.1985, C.W. Huggins s.n. (MEL 1540176); Bayswater, 22.vi.1907, A. Morrison (PERTH).

TYPIIFICATION:

The LECTOTYPE of *H. trisperma* Benth. as here selected consists of two shoots, the left hand one in flower and the right hand one with young pods, mounted on a sheet in W bearing a label in the lower right hand corner which reads '111 *Hovea trisperma* King George's Sound Hügel'. The dehisced pods in an envelope bearing the number

401 mounted on the top left hand corner of the sheet do not belong with the mounted specimens on this sheet and are excluded from *H. trisperma*.

Lindley based his description of *H. lanceolata* var. *linearis* on a plant in cultivation in the nursery of Messrs Low and Co. of Clapton in March 1831. Fortunately a small fragment of the plant from Low's nursery is preserved in Lindley's herbarium at CGE and it is selected here as the lectotype of *H. lanceolata* var. *linearis*. The fragment is mounted in the lower right hand corner of the sheet, the remainder of the sheet being occupied by a specimen collected at the Vasse River by Mrs G. Molloy in 1839.

The description of *H. manglesii* Lindley was based on a specimen cultivated by Robert Mangles of Sunning Hill in Jan. 1837 and on specimens collected in Western Australia subsequently (possibly by Mrs G. Molloy) and communicated to his brother, Capt. James Mangles. The specimen cultivated by Robert Mangles in 1837 and a wild specimen from Western Australia, together with one collected by Drummond in 1839, are mounted on a sheet in Lindley's herbarium in CGE. Although Lindley mentioned having received wild specimens from Capt. Mangles I have only traced the one referred to. I here select the specimen cultivated by Robert Mangles in 1837 mounted in the lower right hand corner of the sheet as the LECTOTYPE of *H. manglesii*. As noted by Lindley, the leaves in this specimen are almost twice as wide as those on the specimen collected in the wild. Lindley commented that *H. manglesii* differed from *H. trisperma* in having a sessile ovary but the ovary illustrated in Edwards's Bot. Reg. 24: t. 62 is shortly stipitate.

Lindley based his description of *H. crispa* on a plant cultivated by Robert Mangles of Sunning Hill. A specimen preserved in Lindley's herbarium at CGE, mounted on a sheet to the right of a specimen collected by Drummond in 1839, is here selected as the LECTOTYPE of *H. crispa*. In the protologue Lindley described the ovary of *H. crispa* as 4-seeded. Although 3 or 4 ovules are recorded in *H. crispa* the ovaries are usually 2-ovulate and the ovary of a flower on the lectotype was found to have 2 ovules.

H. grandiflora Drummond was described from material collected between the Darling Range and Toodyay. The actual locality given was 'the west side of a hill, which the road crosses about a mile to the east of the watering-place called Goolgoil, by the natives . . .'. I have not succeeded in tracing this locality and efforts by Mrs R. Paynter of Toodyay and Mr and Mrs B. H. Smith of Manmanning have likewise been unsuccessful. There are in Herbarium Hookerianum at K two sheets of material bearing three different collections collected by Drummond which are referable to *H. grandiflora*. All three collections are labelled Swan River, Drummond, and although none is named *H. grandiflora* at least two of the collections match the brief description and undoubtedly represent type material. I here select the collection to the right of the 'Herbarium Hookerianum' stamp on the right hand side of the sheet containing two different collections as the LECTOTYPE of *H. grandiflora*. The second collection on the sheet bears very much smaller leaves. The LECTOTYPE consists of two flowering branches, the one on the right mounted with the base at the top of the sheet and the apex at the foot. The shape of some of the leaves on the second sheet of Drummond material matches the description in the protologue better but the specimen is a poor one and consequently was not chosen as LECTOTYPE. Drummond specimens are housed in several other herbaria, for example BM, E, MEL and W, but there is no means of knowing whether or not they formed part of the type collection. Despite the absence of the name '*grandiflora*' on either of the sheets in K I am satisfied that Bentham would have been aware of Drummond's name and that Bentham's var. *grandiflora* was based upon *H. grandiflora* Drummond.

H. splendens Paxton was based on a plant cultivated by Mr Knight, Chelsea, from seed collected in Swan River Colony and sent to Capt. Mangles. I have not succeeded in locating a specimen upon which Paxton's plate was based and consequently now select the plate facing p. 103 in Paxton's Mag. Bot. 10 (1843) as the LECTOTYPE of *H. splendens*. I am not absolutely certain of the identity of *H. splendens* as I have seen no specimen that exactly matches the illustration or description but it is a probable synonym of *H. trisperma*. Bentham (1864, 2: 176) was of the opinion that it was 'very near' var. *crispa*.

NOTES:

H. trisperma is a variable species within which three main variants are evident and these correspond to the varieties *trisperma*, *crispa* and *grandiflora* recognized by Bentham (1864). Variety *crispa* was characterised by Bentham as having ovate to lanceolate often slightly cordate leaves with crisped or sometimes almost crenulate margins, more pubescent calyces and ovaries with 2–4 ovules whereas var. *grandiflora* was characterised by being nearly glabrous, having more coriaceous leaves with entire margins and strongly reticulate surfaces, large flowers and often 6 ovules per ovary. These differential tendencies enabled the material available to Bentham to be sorted readily into the three varieties but the abundant material now available and field observations indicate that each variant is far more variable than was apparent to Bentham and that the distinctions between them break down as the characters typifying each variant are not necessarily always associated together.

In their typical forms each variant is quite distinctive but specimens exhibiting a mixture of characters are difficult to place with certainty. For example, specimens which on the basis of flower size are referable to var. *grandiflora* sometimes have as few as 4 ovules per ovary and linear-oblong leaves characteristic of typical var. *trisperma*. Conversely, specimens with 5 or 6 ovules per ovary and narrow-ovate or elliptic coriaceous leaves with prominent reticulate venation characteristic of var. *grandiflora* do not always have large flowers. Flowers in such specimens can be as small as those in other variants. Specimens with large flowers are not homogeneous in appearance because of the variation in the other characters. There is no discontinuity in flower size, pedicel length or in the number of ovules per ovary between the variants although there is a tendency for var. *crispa* to have 2 ovules per ovary (sometimes 3 or 4), var. *trisperma* to have 3 or 4 ovules (sometimes 2) and var. *grandiflora* 5 or 6 (sometimes 4 or 7). There is no significant difference in the flowering times of the variants. The main differential tendencies may be seen in Table 1.

Crispa appears to be less well differentiated than *grandiflora*. It is not uncommon in the Darling Range to find a range of variation within a population and plants with the characteristic spreading pubescence and crisped margins to the leaves (*crispa*) growing next to plants which lack the spreading pubescence and crisped margins to the

Table 1. The differential tendencies of the three main variants of *H. trisperma*

	Typical <i>trisperma</i>	Typical <i>crispa</i>	Typical <i>grandiflora</i>
Pubescence of branchlets	Hairs mostly appressed and antrorse but sometimes spreading, often crimped	Hairs spreading, usually almost at right angles to branchlet, sometimes crimped	Hairs mostly appressed and antrorse, sometimes crimped, at times glabrescent
Shape of leaf lamina	Linear-oblong, narrow-ovate, ovate or elliptic	Ovate, elliptic, elliptic-oblong, narrow-ovate or almost rotund	Ovate, narrow-ovate, obovate, elliptic, elliptic-oblong, linear-oblong
Leaf margin	Entire	Crisped to almost crenulate	Entire, occasionally almost crenulate
Pubescence of lower surface of leaf	Hairs more or less appressed or sometimes spreading, crimped	Hairs spreading, usually at right angles to the lamina	Hairs appressed or sometimes spreading, sometimes crimped, glabrescent
Pedicel length	1–4 mm	2–4.5 mm	2–7 mm
Length of 2 upper calyx lobes (including tube)	6.5–7.6 mm	6.6–8.1 mm	6.1–11.7 mm
Length of standard	11.5–13.8 mm	10.8–14.8 mm	12.8–20.2 mm
Length of wings	9–11 mm	9.2–12.4 mm	9.5–14.8 mm
Length of keel	6–8.1 mm	8–11.6 mm	6.9–10.3 mm
Number of ovules per ovary	Usually 3 or 4, sometimes 2	Usually 2, sometimes 3 or 4	Usually 5 or 6, sometimes 4 or 7

leaves (*trisperma*). The degree of crisping of the leaf margin can vary quite markedly on a single plant.

To some extent the morphological variation in *H. trisperma* is associated with geographical distribution. Typical var. *trisperma* is the most widespread of the variants occurring from near Gingin in the north as far inland as Kellerberrin southwards to Busselton and south-east to a little east of Esperance, var. *grandiflora* is recorded from Mogumber (with an outlier at Geraldton) southwards to Augusta with an outlier west of Ravensthorpe, and *crispa* occurs chiefly in the Darling Range north-east, east and south of Perth with outliers at Yanchep, Bindoon, Cunderdin, Northam, York and near Crossman. The distributional range of var. *crispa* falls entirely within that of var. *trisperma* and that of var. *grandiflora* overlaps that of var. *trisperma* except in the extreme north and south-west.

Although acknowledging the existence of these differential tendencies within *H. trisperma* the nature of the variation is such that I do not propose to recognize the variants formally. Names at varietal rank are available should anyone wish to use them.

Some specimens of *H. trisperma* with large elliptic leaves have been confused with *H. elliptica*. The two species differ in habit, in the nature of the indumentum on the lower surface of the leaves and *H. elliptica* invariably has 2 ovules per ovary whereas the specimens of *H. trisperma* which have been confused have 3–6 ovules per ovary.

Occasional specimens of *H. trisperma* with linear-oblong leaves are superficially similar to specimens of *H. linearis* from eastern Australia. The latter differs in the nature of the indumentum on the branchlets and lower surfaces of the leaves, in having smaller flowers and pubescent pods.

5. **Hovea pungens** Benth. in Endl. *et al.*, Enum. Pl. Huegel 37 (1837); Bot. Arch. 2: t. 7 (1837); Paxton, Paxton's Mag. Bot. 6: 101 (1839); Meissn. in Lehm., Pl. Preiss. 1: 78 (1844); Benth., Fl. Austral. 2: 176 (1864); Wheeler, Fl. Perth Region 269 (1987). LECTOTYPE (here selected): Western Australia, King Georges Sound, *Huegel s.n.* (W).

H. ulicina Meissn., Bot. Zeitung 13: 30 (1855). *H. pungens* var. *ulicina* (Meissn.) Benth., Fl. Austral. 2: 176 (1864). LECTOTYPE (here selected): Western Australia, Drummond, coll. 6 no. 26 (NY; ISOLECTOTYPE: CGE, MEL).

H. pungens var. *major* Paxton, Paxton's Mag. Bot. 10: 51 (1843). LECTOTYPE (here selected): Mag. Bot. 10: plate facing p. 51. A probable synonym.

Shrub or subshrub to 1.8 m high, single or several-stemmed, often much branched; branchlets densely clothed with a mixture of straight, curled, slightly crinkled or asymmetrically biramate appressed to slightly spreading or antrorse hairs. *Leaves* sessile or subsessile, typically inserted on the branch at an angle of more than 45° and often almost at right angles to it, the lamina arching outward or spreading laterally, often reflexed; petiole up to 0.5 mm long; lamina linear to narrowly elliptic-oblong or ovate-lanceolate, the margins strongly revolute and the lamina occasionally almost subterete, 0.5–3 cm long including the pungent tip, 0.1–0.3(–0.4) cm wide (excluding the inrolled margins), rigid, narrowed apically and terminating in a distinct pungent point, rounded or cordate basally, reticulate and glabrous above, lower surface with hairs usually confined to the midrib, some of the hairs usually asymmetrically biramate. *Stipules* setaceous, 2–5.5 mm long, often diverging, typically persisting for some time. *Inflorescence* axillary, sessile or on peduncles up to 1 mm long. *Flowers* solitary or in 2s or 3s, pedicellate, the pedicels 0.3–0.9 cm long, densely clothed with a mixture of short curled or asymmetrically biramate hairs and longer spreading hairs; bracteoles subulate, 1.5–3.5 mm long, inserted at the base of or a short distance below the base of the calyx, shorter than the calyx-tube, pubescent. *Calyx* densely clothed with short and longer appressed to slightly spreading antrorse hairs: 2 upper lobes 5.8–6.9 mm long including the tube 2–3.5 mm long, the 3 lower lobes 1.3–2.5 mm long. *Standard* 12–16.8 mm long, 12–16 mm wide, deeply emarginate apically (to 6 mm), purplish-blue with a basal

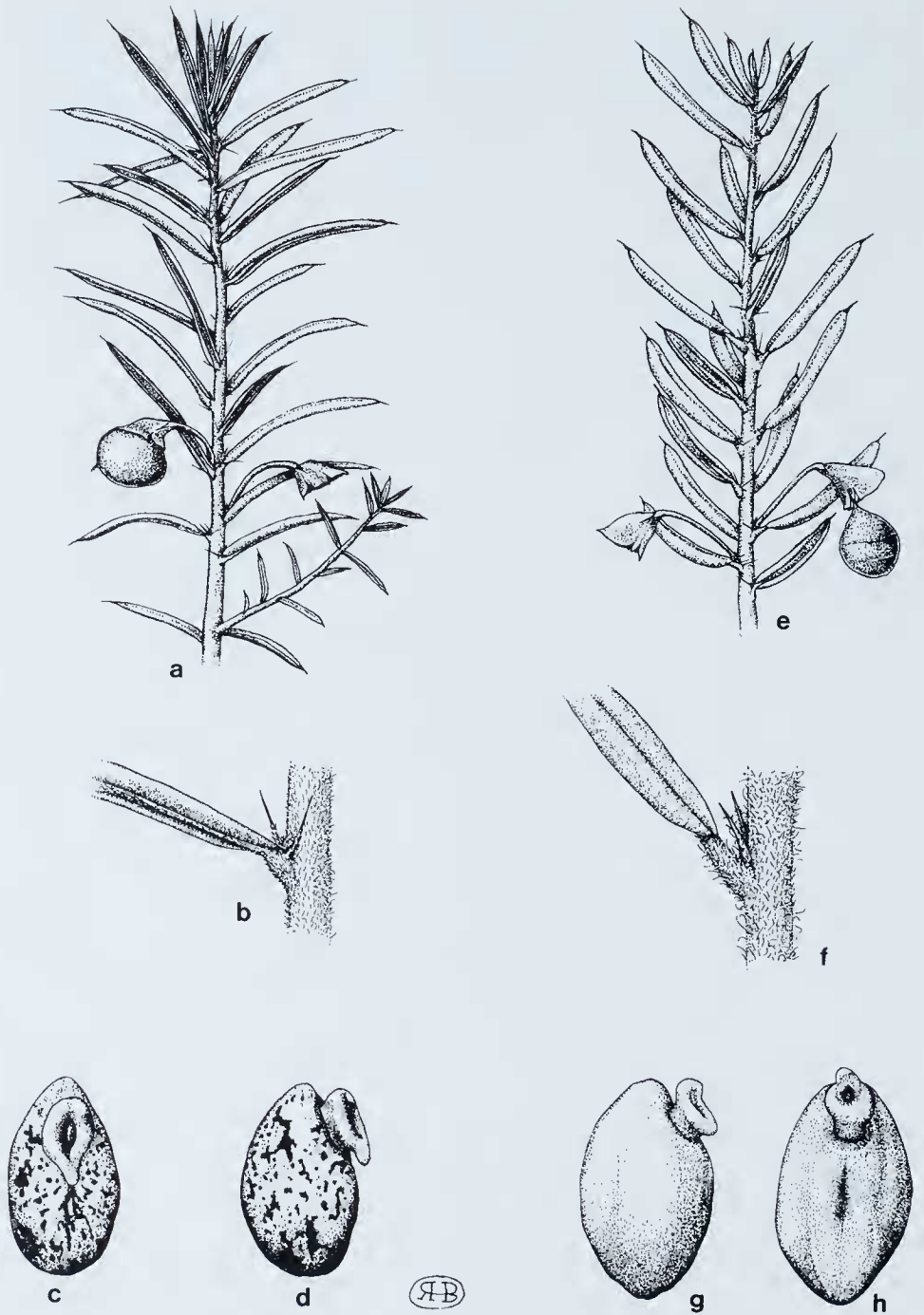


Fig. 5. *Hovea pungens*. a — fruiting twig, $\times 1$. b — portion of stem showing point of attachment of a leaf, $\times 3$. c — seed, hilar view, $\times 6$. d — seed, side view, $\times 6$. *H. stricta*. e — fruiting twig, $\times 1$. f — portion of stem showing point of attachment of a leaf, $\times 3$. g — seed, side view, $\times 6$. h — seed, hilar view, $\times 6$. a-d from R. Pullen 9676 (MEL); e and f from M.G. Corrick 9296 (MEL); g and h from B.H. Smith 646B (MEL).

white horse-shoe shaped flare; wings 9.8–12.5 mm long, 3.5–6.2 mm wide, purplish-blue; keel 4.2–6.7 mm long, 2–2.7 mm wide. *Stamen-filaments* 3.8–6.1 mm long. *Ovary* 1–1.3 mm long, on a stipe 0.4–1 mm long, 2-ovulate, glabrous. *Pods* shortly stipitate, the stipe not exceeding the calyx, obliquely to transversely globular, ovoid or ellipsoid, 0.6–0.9 cm long, 0.7–0.9 cm wide, glabrous. *Seeds* elliptic, plump, 4.1–5.5 mm long, 2–3.2 mm wide, 2–3 mm thick, dark brown or olive-brown with paler mottling, hilum elliptic, $\frac{1}{2}$ to $\frac{3}{5}$ as long as the seed, aril collar-like with a raised lateral lip, yellow. (Fig. 5 a–d).

Found in the Irwin Botanical District, the Drummond and Dale subdistricts of the Darling Botanical District, the extreme west (east of Toodyay) and south (Stirling Range) of the Avon Botanical District and the Eyre Botanical District of the Southwestern Botanical Province of Western Australia with an outlier at Coolgardie in the Coolgardie Botanical District of the Southwestern Interzone as defined by Beard (1980). Within the Southwestern Botanical Province the distribution of the species is interrupted by several disjunctions. It occurs in the northern sandplains and heaths from Burma Rd NW. of Mingenew in the north southwards to the Swan coastal plain and Darling scarp to the vicinity of Armadale and eastwards in the Wheatbelt to Wongamine. The species also occurs in the Stirling Ranges and eastwards in the Transitional Woodland with some further disjunctions to about 100 km E. of Esperance (Fig. 6). The three most northern occurrences of the species at Burma Rd, near Lake Indoon and Mt Lesueur are separated by some distance from the nearest populations near Mogumber and occur within the distributional range of the closely allied *H. stricta*.

Recorded from sandy soil and coastal limestone in low heath, shallow pockets of soil on and around granite outcrops, and from laterite, gravel, clay and loamy soils in heath, jarrah forest and woodland.

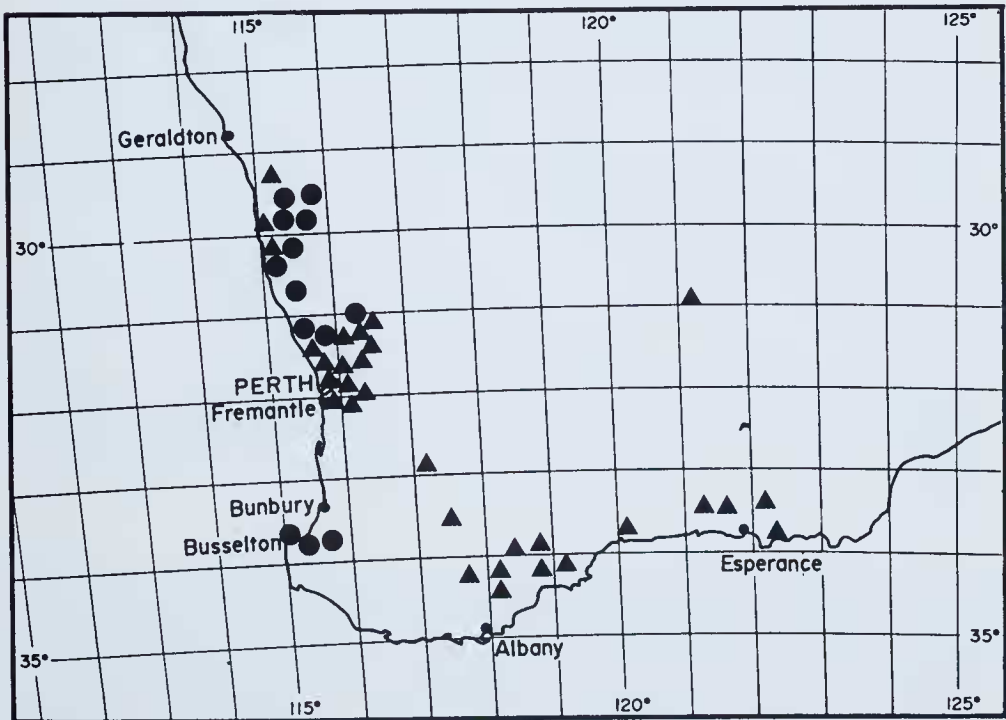


Fig. 6. The known distribution of *Hovea pungens* (▲) and *H. stricta* (●).

REPRESENTATIVE SPECIMENS (total number examined 157):

Western Australia — Coolgardie, 1902, *W.E. Blackall s.n.* (PERTH); 10 km due SSE. of Mt Burdett, 2.viii.1983, *M.A. Burgman 1637 & S. McNee* (PERTH); 1.5 km N. of Mt Lesueur, 20.vii.1979, *E.A. Griffin 1966* (PERTH); Foot of Bluff Knoll, Stirling Range, x.1984, *R. & M. Hamilton 32* (MEL, PERTH); Wongamine Reserve, 19 km NW. of Northam, 19.viii.1983, *B.H. Smith 243* (AD, CBG, HO, MEL, PERTH).

NOTES:

H. pungens is very closely allied to *H. stricta*. Bentham (1864) differentiated the two species on the basis of the shape of the leaf apices, those of *H. pungens* being described as 'pungent-pointed' in contrast to those of *H. stricta* which were described as 'obtuse with a small scarcely pungent point'. This may well have been true of the limited material available to Bentham but the material now available indicates that this character does not enable the two species to be differentiated.

The two species may be distinguished chiefly by the disposition of the leaves on the branches, the shape of the leaves and by the seeds. Very few seeds of *H. stricta* were available for study but as far as can be judged the seeds of the two species differ in colour, in the size of the hilum and the shape of the aril. The seeds of *H. stricta* are a uniform yellowish or olive-brown, the hilum is less than $\frac{1}{3}$ as long as the seed and the aril is shortly columnar whereas those of *H. pungens* are mottled, the hilum is about $\frac{1}{2}$ to $\frac{3}{5}$ the length of the seed and the aril is not as tall. It is unfortunate that seeds are seldom available as it restricts the use of seed as a distinguishing character. The almost invariable absence of seeds means that the two species are differentiated usually on vegetative characters. Despite this, most specimens can be sorted into two species quite readily as each has a different 'look' about it although the differences are difficult to express in words.

The leaves in *H. pungens* are sessile or on petioles up to 0.5 mm long and typically are inserted on the branch at an angle $>45^\circ$ and often almost at right angles to it, the lamina arching outwards or spreading laterally and frequently slightly reflexed. In *H. stricta* the leaves are shortly but distinctly petiolate on petioles 0.75–1.5 mm long and typically are inserted on the branch at an acute angle ($<45^\circ$), the lamina arching outwards and upwards with the apex pointing towards the apex of the branch. These differences in leaf shape are not absolute but the leaf lamina in *H. stricta* tends to be broader than in *H. pungens*. These apparently trivial characters do nevertheless enable most specimens to be sorted into the two species without much difficulty in the absence of seeds.

H. stricta tends to have a denser shaggier indumentum on many of its parts and the stipules are smaller and less persistent than in *H. pungens*. In addition, the growth form of the two species tends to differ, *H. stricta* often being smaller and more sparingly branched.

The application of the name *H. pungens* var. *major* Paxton, published a year before *H. stricta*, is not entirely certain. The plant illustrated is neither typical of *H. pungens* nor of *H. stricta* which is not surprising seeing that it was grown under glass. The diagnostic characters used to differentiate the two species are not readily evident from the illustration but it seems probable that the plant was referable to *H. pungens* rather than to *H. stricta*. A cultivated specimen of *H. pungens* from South Australia shows an approach to the plant illustrated. Rather than treat *H. pungens* var. *major* as a name of uncertain application it is regarded here as a probable synonym of *H. pungens*.

6. *Hovea stricta* Meissn. in Lehm., Pl. Preiss. 1: 79 (1844); Benth., Fl. Austral. 2: 176 (1864). LECTOTYPE (here selected): Western Australia, 'in arenosis sylvae districtus Sussex', Dec. 1839, *Preiss 1057* (LD; ISOLECTOTYPE: MEL, NY).

H. stricta var. *major* Meissn., Bot. Zeitung 13: 30 (1855). LECTOTYPE (here selected): Western Australia, *Drummond coll. 6 no. 27* (NY; ISOLECTOTYPE BM, CGE, K, MEL, NSW, W).

Shrub to 1 m high, single or several-stemmed, usually sparingly branched; branchlets densely clothed with a mixture of straight, curled, slightly crinkled or

twisted villous or asymmetrically biramate spreading to slightly antrorse hairs. *Leaves* shortly but distinctly petiolate, typically inserted on the branch at an acute angle (less than 45°), the lamina arching outward and upward with the apex pointing towards the apex of the branch but sometimes inserted almost at right angles to the branch and spreading laterally; petiole 0.75–1.5 mm long; lamina linear to narrowly elliptic-oblong or ovate-lanceolate, the margins strongly revolute, (0.5–)1.2–4.2 cm long including the pungent tip, 0.15–0.75 cm wide (excluding the inrolled margins), rigid, obtuse apically and scarcely mucronate or narrowed and with a distinct pungent point, rounded or cordate basally, reticulate and glabrous or with scattered hairs above, lower surface with scattered hairs throughout or hairs confined to the midrib or sometimes glabrous, some of the hairs usually asymmetrically biramate. *Stipules* setaceous, up to 2.5 mm long, sometimes not persisting. *Inflorescence* axillary, sessile or on peduncles up to 1.2 mm long. *Flowers* solitary or in 2s or 3s, pedicellate, the pedicels 0.4–1.1 cm long, densely clothed with a mixture of short curled or asymmetrically biramate hairs and longer spreading hairs; bractoles subulate, 1.2–3 mm long, inserted at the base of or a short distance below the base of the calyx, shorter than the calyx-tube, pubescent. *Calyx* densely clothed with short hairs and longer straighter or crisped spreading antrorse hairs: 2 upper lobes 4.4–7.5 mm long including the tube 2.5–4 mm long, the 3 lower lobes 1.6–2.5 mm long. *Standard* 14.5–17 mm long, 11.8–17.3 mm wide, deeply emarginate apically (to 6.5 mm), purplish-blue with a basal white horseshoe shaped flare; wings 11.5–13.5 mm long, 5–6.9 mm wide, purplish-blue; keel 7–7.7 mm long, 2.4–2.9 mm wide. *Stamen-filaments* 4.2–6.2 mm long. *Ovary* 1.2–1.5 mm long, on a stipe \pm 1 mm long, 2-ovulate, glabrous. *Pods* shortly stipitate, the stipe not exceeding the calyx, globular, ovoid or transversely ellipsoid, 0.9–1.1 cm long, 0.9–1 cm wide, glabrous. *Seeds* elliptic, plump, 4.4–5 mm long, 2.8–3 mm wide, 2.5–3 mm thick, uniform yellowish- or olive-brown, hilum oval or elliptic, less than $\frac{1}{3}$ the length of the seed, aril collar-like, shortly columnar, with a raised lateral lip, yellow (Fig. 5 e–h).

Confined to the Irwin Botanical District and the Drummond subdistrict of the Darling Botanical District of the Southwestern Botanical Province of Western Australia as defined by Beard (1980) where there are two disjunct centres of distribution: one in the northern sandplains and heaths from west of Three Springs in the north southwards to the Moore River National Park, and the other from the Busselton area and Cape Naturaliste (Fig. 6). With one exception, all of the specimens from the southern centre of distribution were collected last century and cannot be localised accurately so that the extent and range of the populations is not clear.

In the northern part of its range the species occurs usually on white sand or sand over laterite in low heath, scrub or shrubland. The ecological preferences of the southern populations are not known as none of the specimens is accompanied by ecological data.

REPRESENTATIVE SPECIMENS (total number examined 44):

Western Australia — 4.8 km SW. of Mt Lesueur, 24.vii.1969, *M.I.H. Brooker* 1938 (PERTH); Coorow-Green Head Rd, 16 km E. of Rose Thompson Rd, 6.ix.1984, *D.B. Foreman* 565 (MEL, PERTH); 48 km W. from Three Springs, 27.viii.1948, *C.A. Gardner* 9137 (PERTH); 16 km S. of Regans Ford, 26.viii.1964, *K. Newby* 1386 (PERTH); Vasse River, *Oldfield* (MEL 666572); 39 km NNE. of Jurien on Green Head-Jurien Rd, 28.xi.1974, *R. Pullen* 9676 (CANB, MEL).

NOTES:

The arils of the seeds of *H. stricta* are somewhat atypical for the genus in being less than three times longer than broad. This raises questions about the placement of the species in *Hovea* or the usefulness of this character in diagnosing the genus. Admittedly this observation is based upon the seeds of only one specimen of *H. stricta* which highlights the paucity of fruiting specimens in herbaria, especially those with mature pods and seeds, in many genera of Fabaceae and other families, a fact lamented by Bentham (1864) when discussing *Acacia*. Fruiting specimens of *Hovea* are collected far less frequently than flowering specimens, probably because the fruits are generally

inconspicuous and the plants are overlooked in contrast to the bright flowers which attract attention. More mature seeds of *H. stricta* are required to confirm whether or not the arils are always as observed on the fruiting specimen referred to above. *H. stricta* is very closely allied to *H. pungens*, the seeds of which are typical of *Hovea*. In view of this, and in the absence of any other correlated differential character, it would appear inappropriate to consider excluding *H. stricta* from *Hovea* on the basis of its seeds being different.

For a discussion of the differences between *H. stricta* and *H. pungens* see the notes under the latter species.

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